



$$\mathbf{H} = \begin{pmatrix} 1 \\ 0 \end{pmatrix},$$

$$\mathbf{V} = \begin{pmatrix} 0 \\ 1 \end{pmatrix},$$

$$45^\circ = \begin{pmatrix} \cos \pi/4 \\ \sin \pi/4 \end{pmatrix} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ 1 \end{pmatrix},$$

$$-45^\circ = \begin{pmatrix} \cos -\pi/4 \\ \sin -\pi/4 \end{pmatrix} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ -1 \end{pmatrix},$$

$$\mathbf{CD} = \begin{pmatrix} \cos \pi/4 \\ \sin \pi/4 e^{i\frac{\pi}{2}} \end{pmatrix} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ i \end{pmatrix},$$

$$\mathbf{CI} = \begin{pmatrix} \cos -\pi/4 \\ \sin -\pi/4 e^{i\frac{\pi}{2}} \end{pmatrix} = \frac{1}{\sqrt{2}} \begin{pmatrix} 1 \\ -i \end{pmatrix}.$$